Environmental Security and the Recombinant Human: Sustainability in the Twenty-first Century

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ABSTRACT

Examining the concepts of 'security' and 'sustainability', as they are employed in contemporary environmental discourses, the paper argues that, although the importance of the environment has been increasingly acknowledged since the 1970s, there has been a failure to incorporate other discourses surrounding 'nature'. The implications of the 'new genetics', prompted by research into recombinant DNA, suggest that future approaches to sustainability need to be more cognisant of changes in 'our' nature, as well as those of 'external' nature, the environment. This broadening of the compass of 'security' and 'sustainability' discourses would help provide greater insight into *human* security, from an environmental perspective.

KEY WORDS

Nature, discourse, recombinant DNA, security, sustainability, carbon politics

SUSTAINABILITY IN THE TWENTIETH CENTURY

This paper examines the meaning of 'security' and 'sustainability' in the post-Cold War era, and the way in which the balance between the human individual and nature is changing. The discussion of 'sustainability' has largely been concerned with 'external' nature, with the physical environment and its implications for human societies (Goodman and Redclift 1991, Darier 1999). At the same time, the discourses surrounding 'nature' have also suggested ways in which the human subject itself is changing: through genetics and gender studies, for example (Jordanova 1986, Ginsburg and Rapp 1995). This paper argues that our concern with the sustainability of the environment has failed to establish

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links with the parallel terrain of 'nature', which is located in genetic engineering and biotechnology.

The other strand in the argument concerns the multiple uses of 'security' within the burgeoning literature in environmental security (Barnett 2001). In 1987 the term 'security' was still defined solely in terms of military preparedness. That was the year the Brundtland Commission published its report, *Our Common Future*, which introduced the term 'sustainable development' into our vocabulary (WCED 1987). In 1987 there were still four years before the Cold War ended, unofficially, on 24 August 1991, in a message from President Gorbachev to the world, that the Soviet Union would be abolished.

ENVIRONMENTAL SECURITY

The roots of the twentieth century's 'environmental crisis' were laid in what I term the 'carbon politics' of the 1970s, a key decade for the emergence of hydrocarbons on the global stage, when oil prices rose dramatically in two bursts, and the power of OPEC was born. These difficulties led, in turn, to a public re-examination of the relationship between what came to be known as the 'North' and the 'South', in the form of the Brandt Report (Brandt Commission 1983). Eventually they were to lead to a shift towards incorporating 'environmental' concerns within the wider terrain of human security.

The Brandt Report charted a future for development that relied heavily on raising demand in the South for the goods and services provided in the North. In 1980 the development of the Asian 'Tiger' economies was not yet fully underway, and the so-called 'newly-industrialising countries' were still taking faltering steps towards development. Few people would have predicted, in 1980, that China would maintain a growth rate of between 7 and 10% throughout much of the 1990s, and that it would be expected to have a Gross Domestic Product by 2020 (at purchasing power parity) 20% larger than that of the United States.

In the early 1980s a number of reports were published that were to mark an important stage in the way environmental problems were perceived. First there was the World Conservation Strategy (1983). The evidence of serious environmental problems, many of them on a global scale, and linked to discernible 'global' systems, was becoming clearer, and the second World Conservation Strategy (1991) developed a stronger focus on their interaction with human systems.

The second significant report from the early 1980s was the Global 2000 Report (1982). This document, of over one thousand pages, barely mentioned climate, for example, but it did bring modelling to bear on global issues. Building upon the innovative science and breadth of the Man and the Biosphere programme (MAB) these reports, and the work of the United Nations Environment Program (UNEP) made loud warning noises to the international policy commu-

nity. These assessments, like others at the time, were broadly influenced by the idea that *limitations in the resource base* would make it increasingly difficult to support economic and social development. This was the era, almost quaint from an historical perspective, of 'Limits to Growth' when it was assumed that the major impediment to 'development' was posed by the limited resources of the planet (Meadows 1972).

Two decades ago, then, the environment and development were still seen as parallel but distinct discourses and the 'problems' of development were seen as caused by the limits this placed on human ingenuity. The human individual was set apart from the environment and the effects of economic growth and global inequality on environmental sustainability (Redclift 1983, Redclift 1987). This was an era of modernist aspiration, in which 'development' was viewed as deeply problematic in only one sense – that it was not available to everybody, and that structural inequalities denied it to some. As yet there were few root and branch critiques of the whole 'development' project, as seen from Green or post-modern perspectives (Sachs 1993).

LATE TWENTIETH CENTURY ENVIRONMENTAL CONCERNS

The first environmental concern of the late twentieth century was prompted by the observations of British scientists working in Antarctica. They 'discovered' the ozone hole, an observation which was to drive political pressures for dramatic reductions in CFC gas emissions, culminating in the Montreal Protocol of 16 September 1987.

The Montreal Protocol was a 'second generation' environmental agreement. The first generation of multilateral environmental agreements date back to the early twentieth century, although most were signed in the 1970s and 1980s. They were largely single issue, sectoral agreements, primarily addressing the allocation and exploitation of natural resources, particularly wildlife, the atmosphere and marine environments, the so-called 'global Commons' (Vogler 2000) .

The second generation of multilateral environmental agreements have tended to bridge sectors, and to be based more on 'systems' than problems of resources and jurisprudence. They are more holistic in design. This second generation really commenced with the Earth Summit held in Rio de Janeiro in 1992. Unlike many earlier agreements, the two conventions to which Rio gave rise (the UN Convention on Climate Change and the Convention on Biological Diversity) were highly contested, and involved diplomatic battles and posturing throughout the negotiations. This was witnessed in the meeting of the Conference of the Parties (COP6) in the Netherlands in November 2000.

Both climate and biodiversity issues present major difficulties for a 'traditional' view of environment and development. After the early climate assessments of the Intergovernmental Panel on Climate Change (IPCC) it was more

difficult to view traditional economic activity as an unproblematic 'good'. In the year 2000, according to UNEP (*Global Environment Outlook* Report 1999), governments spent more than $700,000 million a year in subsidising environmentally unsound practices, in the use of water, energy, agriculture and road transport.

Many of these practices reflect 'underlying social commitments' – unquestioned social practices – with serious environmental consequences (Redclift 1996). They include the use that is made of domestic energy, waste disposal and motorised transport. In the wake of UNCED these everyday practices have attracted closer examination and a more concerted effort to identify sustainable alternatives. They have also led us back, inevitably, to the role of the human individual in helping to achieve sustainability.

Climate change was a 'problem' apparently caused not by scarcity but by 'plenty' – by high levels of personal and collective consumption, polluting the medium through which we dispose of our waste (water, air and land). Most obviously, carbon emissions contributed to Greenhouse gas concentrations in the atmosphere.

The 'discovery' that we lived in a 'global village', illustrated most vividly by the effects of human behaviour on global climate, was prefigured by the Chernobyl disaster in the Ukraine. Attention began to be given to the *systems* through which we breathe, eat and reproduce, as key elements in the failure to grapple adequately with sustainability. The reality of globalisation was revealed in the major food scares of the 1980s and 1990s, such as BSE/CJD, and the even larger and more complex issues prompted by the spread of HIV and AIDS. BSE and AIDS were examples of systemic problems which prompted unease with the links between humans and 'nature', as well as the reliability and risks of 'science'. Such problems were global in both senses: they occurred, and were transmitted globally, and they were part of *systems* which were difficult to access, or even fully understand without much more attention to individual human behaviour. They brought scientific uncertainty into the realms of intimacy, of our most intimate social experiences, our sexuality and our tastes in food.

The occurrence of these types of problem also served to undermine an earlier, more confident, view of 'mastering' nature through science.. The modernist impulse to conquer and consume seemed to have been arrested by doubts about the efficacy of science itself. The distinction between dangers that appeared 'out there', and those which concerned us as human individuals, was difficult to maintain. It was difficult to stand 'inside' or 'outside' global issues like climate change, BSE or AIDS, since they permeated territorial boundaries, space and, most significantly, our bodies.

The heightened environmental concern that led to the Earth Summit of 1992 also produced an important stimulus for civil society. This was the renewal of interest in 'grass-roots' environmental consciousness. It is easy to belittle the

importance of Agenda 21, but it was probably this element of the Rio agenda that commanded greatest popular enthusiasm among 'non-experts', the many global publics which were concerned with environmental problems, often from personal experience. Without Local Agenda 21 campaigns fewer people might have listened to the victims of fuel explosions in Mexico, or damaged pipelines in Nigeria. After 1992 there was a 'global' template against which unsustainable practices, and corrupt governments, could be measured, and found wanting.

The raft of policy initiatives after the 1992 Earth Summit also introduced another important element into thinking about sustainable development at the global level. This was the new approach which was beginning to emerge around environmental security. A two-way process was distinguished, in which human societies posed problems for the physical environment (*ecological* security) while the threat of environmental degradation posed problems for national security (Barnett 2001).

Multilateral environmental agreements were increasingly based on '..a holistic approach under which all species should be exploited sustainably or not at all' in the words of UNEP's *Global Environmental Outlook* (1999). However, holistic, multi-sectoral agreements involve so many different and cross-cutting areas of law, policy and international politics that they invariably engender unprecedented conflict. Much more was at stake for contracting parties who sign up to the Framework Convention on Climate Change, than was the case with most agreements twenty years earlier. To paraphrase a recent important contribution to the discussion, understanding the absence of environmental security, means examining the effects of environmental degradation on *people*, on human populations, and their own cultural survival (Barnett 2001, Cocklin 2002).

Other policy research has taken us in important directions. The effort to establish the 'value' of nature has become an area of enormous controversy, in which even the charmed models of economists have been questioned. For those who take a 'radical' view of the imperfections of the market (often termed 'ecological economists') the challenge has been to find ways of internalising environmental costs, and the movement to do so even has a name, derived from the German, 'ecological modernisation' (Simonis 1988).

The other major conceptual, and policy, area that opened up to an unprecedented degree at the close of the old century, was that of 'managing' risks and uncertainties. The unbound copies of Ulrich Beck's *Risk Society* arrived in an unsuspecting academic world just as the British were beginning to recognise the realities, and perils, of CJD/BSE (Beck 1992). Beck's work, and that of others, laid bare the problems of 'high consequence' risks, which could not be contained by better 'reactive' environmental management, the name for most of the environmental policy that had marked the twentieth century. In future the management of risk took greater cognisance of the limitations of the 'expert witness'.

Valuation of nature, like much else, seemed trapped by patterns of thought which neglected things we could not count – largely because we had not developed ways of counting them. The neo-classical solution was to draw nature into the ambit of individual choice and markets. This, in turn, raised problems both in terms of public understanding and the usefulness of 'willingness to pay', when applied to very different publics.

In response to the injunction to quantify environmental damage, and express it in terms of 'external costs', a highly sceptical extreme constructionist 'backlash' set in among many in the humanities and social sciences.

In the view of some social scientists the existence of policy uncertainties, as well as scientific uncertainties, was a condition of modernity itself. We lived in a world of increasingly fragmented sites, which were the product of the way we understood problems, sometimes described as the 'new Medievalism'. In seeking the price of everything, in Wilde's epigram, we risked knowing the value of nothing.

CARBON POLITICS

Looked at differently – post Intergovernmental Panel on Climate Change (IPCC), post Earth Summit – many, if not most, of the twentieth century's concerns had environmental causes. The War in the Pacific is one example of a conflict in which the control over the supply of hydrocarbons played a bigger part in the 'security' of the globe than had hitherto been acknowledged. The collapse of the Soviet Union was another case, in which the weight of energy subsidies hindered the modernisation of the economy and the systems of allocation through central planning. A third example is the growing dispersion from within the so-called 'Third World' today, as significant numbers of people migrate, in the face of their inability to sustain a livelihood. The environment is rarely the only cause of human insecurity, but it is rarely absent from the bigger picture.

Security issues have been increasingly linked to a chain of 'natural' processes, and unanticipated consequences of human demand: bio-diversity losses, hydrocarbon supplies, water and likely climate change impacts. International agreements over Greenhouse gas emissions, and trade (World Trade Organisation), are frequently at variance with national sovereignty and national borders, or have led to borders being contested (the expansion of the European Union eastwards, and that of the United States within the North Atlantic Free Trade Area, in North America).

The other important dimension of the process through which we account for carbon use is that of carbon sinks. Many of the supposed carbon 'sinks' are in the developing world, and in areas such as tropical forests, which are under threat from a number of directions, including transnational corporations themselves. According to some recent models of sustainable development 'community

mobilisation' can be undertaken through 'conservation-with-development'. Development is pursued more sustainably by tying it to the conservation of the environment. This approach emphasises the need to secure community access to valuable natural resources. However, the more we learn about the 'local' the more we realise that it is rarely *purely* local – it is created in part by extra-local influences and practices over time (Watts and Peet 1996, 79). Communities need to be situated within a broader institutional context (Agrawal 1999).

Defenders of the conservation of carbon sinks, as a future means of income-generation in poor, rural communities, argue that in future the valuation of carbon sequestration can enhance community development efforts. Future accords, they argue, will provide such communities with a much valued bargaining tool, in negotiations with governments and transnational companies. This will serve to transform theoretical 'willingness-to-pay' estimates into increased income opportunities.

As so often in the real world, however, these kinds of innovative mechanism could also have perverse effects. In Brazil, for example, the biggest interests in the conservation of carbon sinks are likely to be sugar-cane and paper-pulp industries, which are busily re-inventing themselves as 'Green' industries, positioning themselves for future carbon credits . Poor rural communities are still outside the policy 'loop' and unlikely to benefit in the short-term.

At the same time exciting changes should have taken place which will serve to *decarbonise* our societies. By 2050 the consumption of natural gas and hydrogen should surpass that of coal and oil. Natural gas would then represent a transition towards a *hydrogen-based* society, much of it sourced, admittedly, from hydrocarbons. Historically, the shift has been between dirty solid fuels, with a high carbon content, to liquid hydrocarbons, with a lower carbon content. From wood to coal to oil to gas and, ultimately, to hydrogen.

GENETICS: THE RECOMBINANT HUMAN

The materiality of the environment is evident from the way international politics, and security issues, have gradually incorporated carbon politics. Environmental security can, therefore, be understood in terms of the consequences of our consumption. The material effects of these changes (including climate change) are important, within a critical realist perspective, because they are transforming the 'external world', as well as the symbolic order in which the material world is understood. Changes in materiality have thus become associated with wider social and political changes: in 'self-hood', and governance, in what it means to participate politically, to have our ecological footprints measured, and our carbon contributions weighed. Neo-classical economics has also contributed to the disorder surrounding the human subject and the environment. Market individualism, although prompted by an instrumental logic which viewed

society as the sum of individual, rational calculations, might also be seen as part of a wider 'post-modern' reconfiguration. Under 'post-modernity' the market may even be seen, paradoxically, as bringing us closer to non-human 'nature', by leading us to question our links with nature, rather than setting us apart from it.

This paper began by posing the view that changes in human security have paralleled those in the sustainability of 'external' (non-human) nature. Changes in genetics, especially human genetics, have shifted towards a broader conception of 'nature', forcing us to reconsider what we mean by both 'sustainability' and 'society'. The 'recombination' of the human individual, through a variety of medical and genetic practices, is leading us to consider both social and environmental changes which might serve to eclipse even the carbon politics of the late twentieth century. In the fields of genetics, and particularly human genetics, both 'sustainability' and 'security' have been given additional meaning.

By the early 1980s the molecularisation of biology was already well under way. In a series of technical discoveries the landscape of possibility in molecular biology was fundamentally altered. What became practicable for the first time, was the controlled manipulation of pieces of genetic material. Researchers could snip out sections of DNA from one organism and transfer them to another. One could cut genes out of one cell and splice them into another. The technical term for this activity is 'recombinant DNA research', because what is involved is the controlled recombination of sections of DNA, the hereditary material.

In the wake of these changes in genetics, sustainability is no longer primarily a question of maintaining, and enhancing, existing environmental resources. It is also, increasingly, about engineering new environments. The publication of the first results from the Human Genome project marks a watershed in forcing us to challenge the largely 'taken-for-granted' biology that underpins most environmental politics. The world of individual rights, citizenship and governance is likely to be increasingly concerned with the new realities and thinking in genetics. Looking to the future, we might give more consideration to where this places environmental concerns, rights and governance in the future . Changes in genetics are likely to alter what it means to be socially connected, to participate in civil society. In an increasingly extra-territorial global system, and in which genetic materials can be moved without difficulty from one place (and one species) to another, questions of governance loom large. How do you *govern* a global system made up of genetically modified beings living in genetically modified environments?

In a recent book Kaya Finkler alerts us to the two processes through which the 'new genetics' is assuming authority (Finkler 2000). First, genetic modification has already reached the stage at which the individual is being recombined – beginning with the biological components of the body. By blurring the boundaries between animals and humans this is changing what it means to be 'human'. Concepts that we regard as inherently human, like *identity and*

consciousness, which in turn underpin the acceptance of rights and responsibilities might appear, for the first time, to be infinitely malleable. The human being becomes, as it were, a genetically modified being.

The second noteworthy process, also captured in Finkler's book, concerns the way in which public discourse is being transformed by the new genetics. The communication of genetic knowledge, and the acknowledgement of genetic information, acquires a legitimacy, and a *primacy*, in political discourse, that was previously reserved for social rights and obligations. In a sense biology *becomes* social theory. The technological processes embodied in the new genetics serve to redefine the individual's relationship to society, by changing what it means to be an individual. In place of civil society as the ground of social negotiation, trust and rights, we have the 'alchemy' of the individual.

In *We Have Never Been Modern* Bruno Latour pointed to phenomena which were neither 'social facts' in the Durkheimian sense, nor natural objects – '… they emerge at the intersection of social practices and natural processes as socially constructed forms of mediation between society and nature' (Latour 1993, 11). In Latour's view phenomena like BSE or Global Warming are 'hybrids', incorporating elements of the material and the socially constructed. In the future human genetics, together with other systemic processes, may be poised to shift the ground even further in the direction of mediation between 'nature' and 'society', to the point where what we hybridise is not even perceived as *public* policy. The process of mediation will be complete when it is least recognisable within the public domain, or public discourse.

We already live in a global society where *selecting* a co-parent for genetic characteristics is a reality, and where *surrogate* motherhood is commonly practised. The research community has forced genetic cloning of animals on to the political agenda, and politicians, wary of something they have not begun to think seriously about, have reacted warily. Patenting nature *in vitro* has provoked mixed responses, as it appears to give transnational companies *carte blanche* to invade and remove genetic materials from 'other peoples'' environments.

Many of these moves follow directly from the impasse created by the efforts at global 'management' under the Biodiversity Convention (Luke 1999, McAfee 1999). In other quarters genetic manipulation is defended by medical researchers who are investigating ways of correcting human disability, and working under increasing public pressure. Smart cards, holding vital genetic 'prints' are foreseen as the future biological equivalent of today's passports and identity cards. Like the creatures in Aldous Huxley's imagination, we will soon have inhabited a 'brave new world' without ever really knowing it.

Where does this leave 'environmental security' and the political discourses which were outlined earlier? As the *human subject* itself is changing, then it is logical to assume that the notions of citizenship, democracy and entitlements with which it is linked, might also change. It might be suggested that, in the new world of the twenty-first century, materiality and consciousness bear an increas-

ingly complex relationship to each other. As species boundaries are eroded, and genetic choice dictates individual and public policy the very meaning of 'sustainability' changes. Human security is linked to 'environmental' problems not simply in terms of the physical environment, but also through the way in which the human subject is being transformed. The different rationalities being brought to bear on environmental problems will need to include those of genetic choice and management. The 'securities', and 'insecurities', that we identified as 'outside' ourselves, in external nature, have already been incorporated into our genetic being. After over a century of division between the environment and human 'nature', in which most social sciences forcefully denied a significant role for biology in the explanation of human behaviour, nature has returned to the human subject.

In the light of the much wider view of environmental security with which this paper has been concerned, together with an altered relationship between biological 'nature' and the environment, mapping the geopolitics of environmental security in the new century might begin with the human subject.

While we have been grappling with 'external' nature it is *we* who have been changing. It is not simply the transformation of the environment that is at stake, in the discourses of sustainability and security, but our transformation of ourselves. The divorce between 'our' nature and 'external' Nature has absorbed us in the way we view sustainability and security; in neither case has the radical changes in human and animal genetics been fully taken into account. In practice, of course, they are inter-linked.

This paper argues, then, that the future – for *human* security and the environment – is to recognise 'nature' as *both* internal and external to the human subject. The theoretical landscape of sustainability has changed, and is changing, almost beyond recognition. What happens 'inside' the city walls of post-modernity may be heavily influenced by what happens 'outside', and the city walls are no longer 'society' but the 'individual in society'. Perhaps this is a new Grand Narrative in the making, a product of the insecurity of the end of the Cold War, and designed for the twenty-first century?

NOTE

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